

IT IS CLAIMED:

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1. A composition containing a mixture of human cytokines produced by
 - (a) culturing a human cell line (i) capable of producing cytokines, and (ii)transformed with a PKR gene, in a culture medium effective to cause overproduction of PKR in said mammalian cell line;
 - (b) treating the PKR-overproducing cell line to induce cytokine production; and
 - (c) isolating cytokines produced by said cultured, PKR-overproducing cell line and secreted into culture medium.
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2. The composition of claim 1, which is produced by fractionating the collected cytokines to isolate cytokines having a selected affinity for anti-cytokine antibodies.
3. The composition of claim 1, for use in tumor treatment, wherein the cytokines isolated include two or more cytokines selected from the group consisting of IL-1-alpha, IL-1-beta, IL-2, IL-4, IL-6, IL-12, IFN-alpha, IFN-beta, IFN-gamma, oncostatin, TNF-alpha, TNF-beta, GM-CSF, G-CSF, and M-CSF.
4. The composition of claim 3, wherein the cytokines isolated include two or more cytokines selected from the group consisting of IL-2, IL-12, IFN-alpha, IFN-beta, TNF-alpha, TNF-beta and GM-CSF.
5. The composition of claim 4, wherein the isolating step includes removing from the composition, cytokine(s) selected from the group consisting of IL-3, IL-5, IL-7, IL-8, IL-9, IL-10, IL-11, IL-13 and TGF-beta.
6. The composition of claim 1, for use in treating viral infection, wherein the cytokines isolated include two or more cytokines selected from the group consisting of IFN-alpha, IFN-beta, IFN-gamma, IL-2, IL-3, IL-7, IL-8, IL-12, and GM-CSF.

7. The composition of claim 6, wherein the cytokines isolated include two or more cytokines selected from the group consisting of IFN-alpha, IFN-beta, IL-2, IL-8, IL-12, and GM-CSF.

5 8. The composition of claim 7, wherein the isolating step includes removing from the composition, cytokine(s) selected from the group consisting of IL-1, IL-4, IL-5, IL-6, IL-9, IL-10, IL-11, IL-13, TNF-alpha, TNF-beta, TGF-beta, and oncostatin.

10 9. The composition of claim 1, for use in treating an inflammatory condition, wherein the cytokines isolated include two or more cytokines selected from the group consisting of IL-4, IL-5, IL-10, IL-11, IL-13, soluble TNF receptor (sTNFR), IL-1 receptor antagonist (IL-1ra).

15 B2 10. The composition of claim 8, wherein the isolating step includes removing from the composition, cytokine(s) selected from the group consisting of IL-1, IL-2, IL-3, IL-7, IL-8, IL-9, IL-12, TNF-alpha, TNF-beta, TGF-beta, and oncostatin.

20 11. A method of producing a mixture of cytokines, for use as a therapeutic composition, comprising

(a) culturing a human cell line (i) capable of producing cytokines, and (ii) transformed with a PKR gene, in a culture medium effective to cause overproduction of PKR in said mammalian cell line;

25 (b) treating the PKR-overproducing cell line to induce cytokine production; and

(c) isolating a mixture of at least two cytokines produced by said cultured, PKR-overproducing cell line and secreted into culture medium.

30 12. The method of claim 11, wherein the human cell line is further transfected with a gene that expresses a protein effective to inhibit apoptosis in the cell line.

13. The method of claim 11, which further includes priming the cultured cells with a priming agent selected from the group consisting of PMA, calcium ionophores, sodium butyrate, endotoxin, and cytokines.

5 14. The method of claim 11, wherein said culturing is carried out in serum-containing medium, and said inducing and isolating are out in medium that is substantially serum free.

10 15. The method of claim 11, wherein said isolating includes contacting culture medium containing secreted cytokines with a solid support having surface-attached antibodies specific against the cytokine(s) to be isolated, washing the solid support to remove non-bound material, and eluting the cytokines specifically bound to the support.

15 16. The method of claim 11, for use in producing a cytokine composition useful in the treatment of cancer, wherein the cultured cell line is derived from a parental B-cell or monocyte cell line.

20 17. The method of claim 16, wherein the cell line is selected from the group consisting of [named B-cell and monocyte cell lines].

25 18. The method of claim 11, for use in producing a cytokine composition useful in the treatment of viral infection, wherein the cultured cell line is derived from a parental B-cell or fibroblast cell line.

19. The method of claim 18, wherein the cell line is selected from the group consisting of [named B-cell and fibroblast cell lines].

30 20. The method of claim 11, for use in producing a cytokine composition useful in the treatment inflammation, wherein the cultured cell line is derived from a parental T-cells.

21. The method of claim 20, wherein the cell line is selected from the group consisting of [Jurkat, CEM, others].
22. A method of treating a cancer, by administering to a patient in need of such treatment, a therapeutically effective amount of the composition of claims 3-5.
23. A method of treating a viral infection, by administering to a patient in need of such treatment, a therapeutically effective amount of the composition of claims 6-8.
- 10 24. A method of treating inflammation, by administering a therapeutically effective amount of the composition of claims 9 and 10.

A handwritten signature, possibly "Tadd A.", is written over a large, roughly triangular redaction mark.